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Virtual Reality

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The article discusses a completely new sphere of modern technologies. The goal of the article is to define the concept of "virtual" and reveal the original term "virtual reality." From the article one can find out how a person uses virtual reality in various areas of activity, as well as how VR was developed, what potential it has in the future.

The nature of human society is constantly gaining new fields of knowledge. Virtual reality is a space created artificially, using technical means. VR replicates the world around it, gives a sense of presence and immersion in another dimension. Special effects are perceived by human consciousness, give a sense of reality of presence. You can touch, hear and see, even feel what is happening on the screen. The essence of visual modeling is the application of human behavior, their attitude to the surrounding objects of reality, and interaction with them.

Virtual reality (VR) is an artificial world that does not exist in nature, into which a person can completely "immerse" not only as an observer, but also as a participant.

The virtual reality system should give the user response to the actions taken a picture, sound, as well as a complex of tactile and other sensations instantly, without noticeable delays.

It supports one or more users. Virtual reality systems are distinguished by the number of simultaneous users and divided into individual and collective. As a rule, individual systems are

created on the basis of display devices, with which only one person can work (helmets, glasses, etc.).

The VR system should produce a stereoscopic image that provides a sense of the depth of space. A person has binocular vision, that is, he perceives the world with both eyes at once. At the same time, the images observed by each eye are slightly different from each other and individually do not have bulk, but our brain adds two pictures into a single three-dimensional image. Modern technologies for generating pseudo-volumetric pictures are based on this effect, and so-called stereoscopic pairs of images have been created that provide the illusion of volume.

Interactivity is the ability to interact with the virtual world. In a "virtual universe," the user must be an exclusively active observer. It should be able to interact with the virtual environment, and it will in turn rely on user actions. This allows the user to look around and move in any direction within the virtual environment.

The first use of the concept "virtual" was found in the 15th century literature. It was meant "something that was not really there [1]." In the early 60s of the 20th century, virtual meant something created thanks to a computer program. In 1982, Damien Broderick used the term "virtual reality" in his Judas Mandala novel in the science fiction genre.

The early instrumentation of virtual reality occurred in 1962. Then Morton Heilig showed the first prefiguration of a multi-sensory simulator called Sensorama. Viewers immersed themselves in virtual reality thanks to the short issues of Sensorama. It was possible to feel the smell, wind and sounds of the big city.

In 1967, Ivan Sutherland designed and made a description of the first helmet for a computer. Any user could understand its interface and visual implementation, but the HMD (head display) was too heavy to put on his head, so it

was attached to the plafond. Virtual graphics included primitive model rooms with wireframes. The device had the specific title – the "Damocles Sword." The helmet allowed you to change images using head movement.

In the 1970s computer-generated imagery completely replaced video. Previously, it was used in different types of simulators. At the same time, the imagery was the easiest one, but flight simulators could work in the real time environment. In the early 80s the Institute of Technology in Massachusetts produced the first virtual reality program, which was called "Aspen Movie Map." It was a simulated walk through the city of Aspen in Colorado. Various methods of displaying the terrain were offered for choice. To display two seasons versions, real photographs of the city were used.

Until the 90s the "virtual reality" industry was improved and widely distributed among users, and research on VR technologies continued. After 1990, the first series of this product began to appear in computer stores. So, in 1994, Sega introduced a simulator of the Sega VR-1 movement for Sega Machines World. This simulator reacted to head movements and was distinguished by 3D graphics. It was produced on the basis of the Sega Model 1 motherboard. In 1995, the Nintendo Virtual Boy console was released [2].

Application. VR is necessary for professional training for train drivers, aircraft pilots, climbers and rescuers, etc.

In recent years, virtual mechanisms have proved to be a powerful tool for learning. So, with the help of VR, you can perform certain tasks.

Case Western Reserve University approved the introduction of augmented reality technology Microsoft in student education. With the help of VR, San Diego teacher Charles Kumber was able to explain the topic "Types of angles in geometry" in just 17 minutes.

Virtual reality capabilities are also widely used in industry and construction. This technology is considered to be an element of the fourth industrial revolution. In the field of construction, VR is used in two areas - designing and finding optimal solutions by architects, designers and engineers. So, the customer can view the visualization of the future project both completed and during the work stages.

Virtual reality technologies are being actively introduced in various fields of human activity. These are engineering, design, mining, construction, etc. The coronavirus pandemic that happened in 2020 set a sharp pace for the development of VR.

So virtual reality today is not just entertainment or a computer game. It allows you to model, train, conduct tests and do work on errors in complex professions. The further development of technologies will make most of the capabilities of virtual reality, which will benefit human activity in various areas.

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